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EXAMINER

THAI, L

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

08/15/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.  
**09/199,305**

Applicant(s)  
**Ohsawa et al.**

Examiner  
**Luan Thai**

Group Art Unit  
**2811**



☐ Responsive to communication(s) filed on \_\_\_\_\_.

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claims

☒ Claim(s) 1-5 and 11-15 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-5 and 11-15 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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### DETAILED ACTION

The indicated finality of the rejection of the last Office action (paper No. 12) of claims 1-15 is withdrawn in view of the newly discovered reference to Fukutomi et al. (5,976,912).

Rejections based on the newly cited reference(s) follow.

#### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

2. Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticipated by Chia et al. (5,841,191) as set forth in the previous Office Action paper Number 8 and now repeated with more details.

Regarding claims 1-2, Chia et al. discloses (see figures 1-2) a semiconductor device comprising: a plurality of wiring films 14 form on a front surface of a base comprising an insulating resin 22 and having electrode-forming holes 16' (see figure 2), the surfaces of the wiring films 14 and the surface of the base 22 being positioned on the same plane (see figure 2) and a part of the wiring films 14 overlapping with the electrode-forming holes (see figure 2); a conductive material embedded into the electrode-forming holes 16' (Col. 2, lines 6+) to form external electrodes on

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the back surface, away from the wiring films, of the base; a semiconductor element 20 positioned on the front surface of the base with an insulating film 10 therebetween (Col. 2, lines 1+), the back surface of the semiconductor element being bonded to the front surface of the base; and wires 24 for bonding the electrodes of the semiconductor element to the corresponding wiring films; and a resin sealed the semiconductor element and wires.

Regarding claim 3, Chia et al. further discloses a metal ring 30 being bonded on the front surface of the base at the exterior of the connecting sections with wires in the wiring films 14 (figs. 1-2).

3. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Distefano et al. (5,821,608) as set forth in the previous Office Action paper No. 8 and now repeated with more details.

Distefano et al. discloses (see figure 3G) a semiconductor device comprising: a plurality of wiring films 50' form on a front surface of a base 30' comprising an insulating resin 30' (see figure 3G) and having electrode-forming holes filled with a conductive material to form external electrodes 40 on the back surface (see figure 3G) away from the wiring films, of the base; the surfaces of the wiring films 50' and the surface of the base 30' being positioned on the same plane (see figure 3G) and a part of the wiring films overlapping with the electrode-forming holes; a semiconductor element 10 positioned on the front surface of the base with an insulating film 80 therebetween, the back surface of the semiconductor element being bonded to the front surface of the base; wires

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140 for bonding the electrodes 20 of the semiconductor element to the corresponding wiring films; and a resin 60' sealed the semiconductor element and wires.

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (5,841,191) and Distefano et al. (5,821,608) as set forth in the previous Office Action paper Number 8 and now repeated.

Chia et al. and Distefano et al. disclose all the limitations of the claimed invention as detailed above with the exception of the semiconductor device being comprised of an electronic device. It would have been obvious for the semiconductor devices as taught by Chia et al. and Distefano et al. to be used as intended in a larger electronic device.

6. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (5,841,191) and Distefano et al. (5,821,608) in view of McCormick et al. (5,909,057) as set forth in the previous Office Action paper Number 8 and now repeated.

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Chia et al. and Distefano et al. disclose all the limitations of the claimed invention as detailed above with the exception of a reinforcement having a downward indented face covering the semiconductor element. McCormick et al. while relates to a similar semiconductor device teaches (see figures 2B-2F and 4A-4B) a reinforcement 214 having a downward indented face covering the semiconductor element 200 in order to prevent the semiconductor element from being warping or other wise moving during the curing step (Col. 8, lines 1+). McCormick et al., Chia et al. and Distefano et al. are analogous art because they are from the same field of endeavor, that is the semiconductor art. It would have been obvious to one having ordinary skill in the art to combine the reinforcement as taught by McCormick et al. into Chia et al.'s and Distefano et al.'s device in order to prevent the semiconductor element from being warping or other wise moving during the curing step.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (5,841,191) in view of Shim et al. (5,708,567) as set forth in the previous Office Action paper Number 8 and now repeated.

Chia et al. discloses all the limitations of the claimed invention as detailed above with the exception of the base having vent holes. Shim et al. while relates to a similar semiconductor device teaches (see figure 1) the base 20 having the vent holes 23 for the purpose of generating the heat from the semiconductor chip (Col. 1, lines 45+). Chia et al. and Shim et al. are analogous art because they are from the same field of endeavor, that is the semiconductor art. It would have

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been obvious to one having ordinary skill in the art to apply the conventional vent holes formed in the base as taught by Shim et al. into Chia et al.'s device for the purpose of generating the heat from the semiconductor chip.

8. Claims **14-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Chia et al. (5,841,191) and Distefano et al. (5,821,608) in view of Fukutomi et al. (5,976,912).

The proposed devices of Chia et al. and Distefano et al. disclose all the limitations of the claimed invention as detailed above with the exception of a nickel layer covering the copper layer of the wiring film. Fukutomi et al. while relate to a similar semiconductor package design teach (see figures 1-25, specifically see figures 22a-22g) a wiring layer being formed by a layer of copper 63 covered by a nickel layer 64 so that the wires 67 are bonded to the nickel layer (Col. 23, lines 12-17) to have high integration of semiconductor chips which can be fabricated stably with good productivity (Col. 26, lines 57+). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply Fukutomi et al.'s teachings into the proposed device of Chia et al. and/or Distefano et al.

9. The following references are cited as of interest to this application:

U.S. Patent No. 5,909,085 to Yano is cited for showing the surface of the wiring film and the surface of the base being positioned on the same plane and U.S. Patent No. 5,859,475 to Freyman et al. is cited for showing the metal ring being bonded on the front surface of the base.

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***Response to Arguments***

**10.** Applicant's arguments with respect to claims **1-5 and 11-15**, filed on July 28, 2000 have been fully considered but they are not persuasive. Specifically:

[a] Applicant argues, in page 3, first paragraph, of the Remarks, that the reference does not teach wiring films on a front surface of the base.

In response, the examiner points out that the solder mask 22 in Chia et al.'s device is an insulating material; therefore, it is considered as the base which comprises an insulating resin as claimed by applicant (Note US Pat. 5,710,071 to Beddingfield et al., Col. 5, lines 48+ and US Pat. 5,973,337 to Knapp et al., Col. 2, lines 46+ are cited to support the well known position). Since the base 22 (i.e., Chia et al.'s insulating layer 22) is disclosed, the surface of the wirings 14 and the surface of the base 22 clearly are positioned on the same plane, and the semiconductor element 20 is positioned on the front surface of the base 22. Furthermore, the labels nonetheless are meaningless. The Chia et al.'s structure anticipates Applicant's claimed structure regardless of whether the layer is labeled "base". See *In re Pearson*, 181 USPQ 642; *Fx parte Minks* 169 USPQ 120; or *In re Swinehart* 169 USPQ 226, all of which make it clear that mere "labels" or "statements of in intended use" as we have here in "base" do not distinguish over Chia's structure which may be likewise labeled.

[b] Applicant argues, in page 3, second paragraph, of the Remarks, that the base 30' (Distefano et al. reference) does not have the semiconductor element mounted thereon.

In response, the examiner confirms that Distefano et al.'s figure 3G shows the semiconductor element 10 being mounted on the base 30' with an insulating film 80 therebetween (Distefano et al.'s Col. 6, lines 10+). Distefano et al.'s figure 3G further shows wirings 50' being on the front surface of the base and surfaces of the wirings and the surface of the base being positioned in the same plane.



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[c] Applicant argues, in page 4, third paragraph, of the Remarks, that Shim et al. does not teach or suggest “vent holes” as applicant claimed in claim 5.

In response, the examiner points out that, although Shim et al. does not label the holes vertically formed on the chip mounting portion of the base 20 as that applicant claimed “vent holes”, the holes disclosed by Shim et al. are considered as “vent holes” for their function of heat dissipating improvement for the device (Shim et al.’s Col. 1, lines 45+ and Col. 3, lines 56+). Further, figure 2 of Shim et al. does not distinguish from the claimed structure and the labels nonetheless are meaningless. The Shim et al.’s structure anticipates Applicant’s claimed structure regardless of whether the layer is labeled “plated through holes”. See *In re Pearson*, 181 USPQ 642; *Fx parte Minks* 169 USPQ 120; or *In re Swinehart* 169 USPQ 226, all of which make it clear that mere “labels” or “statements of intended use” as we have here in “vent holes” do not distinguish over Shim et al.’s structure which may be likewise labeled. In addition, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971) references are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA 1969).

11. Applicant's arguments with respect to claims 14-15 have been considered but are moot in view of the new ground(s) of rejection.

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***Conclusion***

**12.** Applicant's amendment filed on February 22, 2000 have been fully considered but they are not persuasive (regarding claims 1-5 and 11-13), and they are deemed to be moot in view of the new grounds of rejection (regarding newly added claims 14-15 which raise new issues that would require further consideration and/or search). Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

**13.** Papers related to this application may be submitted to Technology center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the TC 2800 Fax center located in Crystal Plaza 4, room 4-C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 2811 Fax Center number

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is (703) 308-7722 and 308-7724. The Group 2811 Fax Center is to be used only for papers related to Group 2811 applications.

**14.** Any inquiry concerning this communication or any earlier communication from the Examiner should be directed to **Luan Thai** whose telephone number is **(703) 308-1211**. The Examiner is in the Office generally between the hours of 7:30 AM to 4:00 PM (Eastern Standard Time) Monday through Friday.

Any inquiry of a general nature or relating to the status of this application should be directed to the **Technology Center Receptionists** whose telephone number is **(703) 308-0956**.

08/10/2000

Luan Thai

Tom Thoma